

IN THE CLAIMS:

1 1. (Original) In a particulate matter concentration measuring apparatus for
2 measuring a concentration of particulate matter in a sample gas collected in a collecting region
3 formed on a collecting member, the collecting region being formed by drawing the sample gas
4 through a cross-sectional area of the collecting member from one face side to the other face side,
5 wherein

6 the collecting member is a filter tape, the filter tape includes a porous film made
7 of a fluorine resin for trapping particulate matter in the collecting region, the filter tape includes
8 a reinforcing layer on the porous film, the reinforcing layer allows the transmission of the sample
9 gas.

1 2. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 wherein the particulate matter concentration is measured using a beta-ray
3 absorbing method.

1 3. (Original) The particulate matter concentration measuring apparatus of Claim 2,
2 wherein the particulate matter concentration measurement includes a
3 compensation for any error caused by naturally occurring alpha and beta radiation.

1 4. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 wherein the particulate matter concentration is measured using a pressure loss
3 method.

1 5. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 wherein the filter tape presents the porous film on one face side and presents the
3 reinforcing layer on another face side.

1 6. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 wherein the reinforcing layer comprises a non-woven fabric having a low
3 hygroscopic property.

1 7. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 wherein the reinforcing layer is a non-woven fabric selected from the group
3 consisting of polyethylene, polyethylene terephthalate, nylon, polyester and polyamide.

1 8. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 further comprising:
3 a supporting means for supporting the filter tape in the collecting region, the
4 supporting means having a plurality of exhaust holes for discharging the sample gas passing
5 through the filter tape and supporting the filter tape against being deformed in the collecting
6 region, the support means having at least four exhaust holes, the exhaust holes being disposed
7 with approximately circular symmetry around a predetermined central position.

1 9. (Original) The particulate matter concentration measuring apparatus of Claim 8,
2 wherein the supporting means includes a thin plate-like portion within which the
3 plurality of exhaust holes are formed in a honeycomb shape.

1 10. (Original) The particulate matter concentration measuring apparatus of Claim 8,
2 wherein the supporting means includes a first clamping means and a second
3 clamping means which move together to securely hold the filter tape at a time of collecting the
4 particulate matter while permitting the passage of the sample gas through the filter tape, the first
5 clamping means and second clamping means being moved apart so as to release the filter tape at
6 a time of moving the filter tape.

1 11. (Original) The particulate matter concentration measuring apparatus of Claim 10,
2 wherein a recess portion is formed in the first clamping means and a
3 corresponding convex portion is formed in the second clamping means, the complementary
4 recess and convex portions for preventing the filter tape from being displaced during clamping.

1 12. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 further comprising:
3 an impact type sampler for performing a filtering of particulate matter in a sample
4 gas by removing from the sample gas the particulate matter having a large particle diameter on
5 the basis of collisions within the sample gas and selectively sampling the particulate matter
6 having a small particle diameter prior to collection of the particulate matter in the collecting
7 region, the impact type sampler having a sample intake portion, the impact type sampler having
8 an output port for conducting a filtered sample gas to the collecting region, the impact type
9 sampler being detachably connected to the particulate matter concentration measuring apparatus.

1 13. (Original) The particulate matter concentration measuring apparatus of Claim 12,
2 further comprising:

3 a mounting flange for mounting a sample introduction portion to the sample
4 intake portion of the impact type sampler, the sample introduction portion being a cover body
5 having approximately the same outer shape as an outer shape of the mounting flange and
6 forming a pipe connection portion in a center portion thereof, the pipe connection portion having
7 a taper-shaped receiving port.

1 14. (Original) The particulate matter concentration measuring apparatus of Claim 12,
2 further comprising:

3 a dust removing filter for removing dust from the sample gas, the dust removing
4 filter being detachably mounted to the pipe connection portion so as to remove dust from the
5 sample gas prior to introduction of the sample gas into the impact type sampler.

1 15. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 further comprising:

3 a cyclone type sampler for filtering particulate matter in a sample gas using
4 centrifugal separation of the particulate matter prior to collection of the particulate matter in the
5 collecting region, the cyclone type sampler having an input port for admitting the sample gas and
6 an output port for emitting a separated sample gas, the input port of the cyclone type sampler
7 being connected to the source of the sample gas, the cyclone type sampler output port being
8 connected to the particulate matter concentration measuring apparatus so as to conduct the
9 filtered sample gas to the collecting region, the cyclone type sampler being detachably connected
10 to the particulate matter concentration measuring apparatus.

1 16. (Original) The particulate matter concentration measuring apparatus of Claim 1,
2 further comprising:

3 an impact type sampler for performing a filtering of particulate matter in a sample
4 gas by removing from the sample gas the particulate matter having a large particle diameter on
5 the basis of collisions within the sample gas and selectively sampling the particulate matter
6 having a small particle diameter prior to collection of the particulate matter in the collecting
7 region, the impact type sampler having a sample intake portion, the impact type sampler having
8 an output port for conducting a first filtered sample gas to the collecting region, the impact type
9 sampler being detachably connected to the particulate matter concentration measuring apparatus;

10 a cyclone type sampler for filtering particulate matter in a sample gas using
11 centrifugal separation of the particulate matter prior to collection of the particulate matter in the
12 collecting region, the cyclone type sampler having an input port for admitting the sample gas and
13 an output port for emitting a separated sample gas, the input port of the cyclone type sampler
14 being connected to the source of the sample gas, the cyclone type sampler output port being
15 connected to the particulate matter concentration measuring apparatus so as to conduct a second
16 filtered sample gas to the collecting region, the cyclone type sampler being detachably connected
17 to the particulate matter concentration measuring apparatus; and

18 a switching means for selecting between the first filtered sample gas from the
19 impact type sampler and the second filtered sample gas from the cyclone type sampler for
20 conducting to the collecting region.

1 17. (Original) The particulate matter concentration measuring apparatus of Claim 16,

2 wherein the switching means is an electro-mechanical switch.

1 18-21. (Cancelled)

1 22. (New) Apparatus for measuring particulate matter in a sample gas, comprising:

2 a collecting member;

3 a chamber for removably positioning the collecting member to interact with the
4 sample gas containing a quantity of particulate matter through the collecting member to form a
5 collecting region, a portion of the particulate matter in the sample gas being trapped in the
6 collecting region;

7 an irradiation source of beta-rays for irradiating the particulate matter in the
8 collecting region;

9 a detector unit for detecting the beta-rays that have passed through the collecting
10 region to provide a representative signal; and

11 a control unit for determining particulate matter concentration from the
12 representative signal and a correction value representative of naturally occurring beta rays.

1 23. (New) The apparatus of Claim 23 further including a source of alpha rays, an
2 alpha ray detector and the control unit determine the particulate matter concentration from both
3 representative signals of the alpha and beta rays and correction values representative of naturally
4 occurring alpha and beta rays.

1 24. (New) The apparatus of Claim 22 wherein the collecting member is a filter tape
2 mounted on a roll and the control unit can progressively advance the filter tape after each
3 sampling.

- 1 25. (New) The apparatus of Claim 24 wherein the filter tape is a fluorine resin layer
2 on a reinforcing layer.